Rational Choice, Collective Decision And Social Welfare (位相幾何学と経済学)

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RATIONAL CHOICE, COLLECTIVE DECISION AND SOCIAL WELFARE

ABSTRACT

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The theory of collective choice and social welfare is primarily concerned with the general principle or rule for resolving conflict situations in a society consisting of free individuals. Precursors in the theory of collectice choice have uncovered a host of logical difficulties in the form of impossibility theorems on the "reasonable" collective choice rules. It seems to us that these "paradoxes" and/or "logical contradictions" serve as unequivocal signal for the necessity of critically reexamining the conceptual framework in which these impossibility theorems have been discovered. We will contend that the impossibility theorems are mainly due to the narrow informational basis of the traditional approach to collective choice and social welfare, which has confined its attention to intrapersonally ordinal and interpersonally non-comparable information. We will also try to maintain that the ultimate guarantee of the successful working of a scheme of fair conflict resolution lies not in the mechanical design of the rule per se but in the individual's attitude towards others —— sympathy, care for others' well-being, and respects of others' equal liberty and rights.

The composition of this monograph is as follows:

Chapter 6 Individual Rights and Libertarian Claims

0. Introduction
1. Inviolable Rights, Pareto Principle and an Impossibility Theorem
2. Coherent Rights-System, Respect of Others' Rights and a Possibility
3. On the Consistency of Group Autonomy
4. Grading Principle, Leximin Justice and Inviolable Rights
5. Decomposable Rights-System and Libertarian Claims
6. Concluding Remarks

Chapter 7 Epilogue

Appendix Compensation Principle, Distributional Value Judgements and Piecemeal Welfare Criteria

0. Introduction
1. Hypothetical Compensation Criteria
2. Piecemeal Welfare Criteria
3. Proofs
4. Concluding Remarks

Let us briefly summarize the main contents of each chapter.

The Chapter 1 introduces our problem formally and presents the plan of the book. The critically important concept of the primordial stage of constitutional choice is explained in detail. In this hypothetical situation, it is supposed that "a veil of ignorance" prevents anyone from being advantaged or disadvantaged by the natural and/or social contingencies. No one knows his future position in the society, and everyone knows that the rule chosen now will be binding indefinitely in the future. Therefore in this primordial stage of constitutional choice, each individual will have

every incentive to propose a collective choice rule —— a constitutional rule or principle of conflict resolution —— of a general nature. It is assumed that the game of primordial constitutional choice proceeds as follows. Each individual proposes some general performance criteria which he wants the rule to satisfy. Those criteria which succeed in acquiring unanimous consent will be selected from among proposed criteria, and a rule satisfying all of these agreed-on criteria is characterized and is submitted for the unanimous acknowledgement. An important fact is that a rule need not necessarily be unanimously acknowledgeable simply because each one of its component axioms acquires prima facie agreement among individuals. The joint effect of a set of individually appealing axioms on the collective choice rules might turn out to be an unappealing rule or, even worse, the combination of individually innocent and persuasive axioms might annihilate all conceivable collective choice rules. These "paradoxes" and/or "logical contradictions" serve as powerful stimuli to critically re-examine the individual axiom and, going back one step further, the conceptual framework in which these axioms are phrased. Hopefully we may thereby infiltrate to the more appropriate understanding of the factors which are responsible for the institutional stability of the voluntary association of free individuals. This is the frame of thought we consistently keep in mind throughout this work.

In the Chapter 2, we expound the theory of binary relations with special emphasis on the extension theorems for binary relations. The results gathered together in this chapter will be frequently needed in the whole book.

The Chapter 3 formally introduces the concepts of a choice function and the rationality thereof with a view to axiomatically characterize the concept

of rational choice functions. We say that a choice behaviour is rational if it is made in accordance with the optimization of some underlying preference relation. In particular a choice behaviour is said to be full-rational if it is rational in the above sense and that the underlying preference relation satisfies the logical requirements of connectedness and transitivity. These concepts are characterized in this chapter in terms of the revealed preference and related axioms. Some "irrational" choice functions are also examined en route in view of the role they play in the rest of this study.

The Chapter 4 formalizes the problem of the primordial constitutional choice and examines Arrow's general impossibility theorem on the "democratic" collective choice rules. Special care will be taken with the robustness of the Arrovian impossibility theorems with respect to the successive weakening of collective rationality requirement. Along the way a few concrete collective choice rules —— the simple majority decision rule, the Borda method, and the Copeland method —— are introduced and their properties critically examined.

In the Chapter 5 we examine the effect of widening the informational basis of the collective choice rules. Instead of confining our interest to the intrapersonally ordinal and interpersonally non-comparable information, we now allow the interpersonal welfare comparisons in the form of extended sympathy. Two main rival principles of justice —— the Rawlsian lexicographic maximin principle and the Benthamite utilitarian principle —— are characterized and their contrast highlighted. We then consider the problem of constructing the generalized collective choice rules which aggregate the extended utility functions, one function for each individual, into the social choice function. Notice that the interpersonal welfare comparisons made

by each individual are interpersonally incommensurable. The generalized collective choice rules we construct do not illegitimately presuppose the commensurability of the interpersonal comparisons made by each and every individual, neither do they require the identity of individuals' sense of justice. In this very general setting, we show that the rule constructed on the basis of the interpersonal welfare comparisons made independently but with sympathy by each and every individual is always applicable, works with the minimum informational inputs, treats individuals and alternatives fairly, reflects unanimous preferences faithfully, does not allow the existence of a vetoer, and generates choice functions with some choice-consistency properties, together with yielding "just" outcomes in resolving the conflict situations.

In the Chapter 6, we examine another class of impossibility theorems and the resolutions thereof. The impossibility theorems in question maintain the incompatibility of democratic values and libertarian claims and assert that the unadulterated exercise of libertarian rights, coupled with the mechanical use of the Pareto unanimity rule, may disqualify all collective choice rules with unrestricted domain as inadmissible. Two resolution schemes are presented in this chapter, the first of which restricts the mechanical use of the Pareto unanimity rule, while the second of which restricts the rights-exercising of each and every individual by the Rawlsian leximin principle of justice. They differ in their informational requirements as well as in their basic attitude towards libertarian rights and democratic values. Nevertheless they share a common general moral: The ultimate guarantee of a minimal amount of libertarian rights in a democratic society lies in the individuals' attitude which respects and cares for each

other's equal basic liberty and the realization of justice in resolving the conflict situation.

The Chapter 7 makes some broad observations and qualifications.

We have an appendix at the end of the book, where we analyse the structure of hypothetical compensation principles and piecemeal welfare criteria. Various compensation principles are formulated and their interrelations clarified. Making use of these preliminary steps, we then formulate Little's proposed piecemeal welfare criteria, over which we have had a rather cloudy debate in the past. We maintain that the logical performance of Little's criteria is much better than what one might be led to presume by following the debate in the literature, although it is somewhat vacuous unless we may fill in the empty box labelled as "distributional value judgements."

Rational Choice, Collective Decision and Social Welfare

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1. Framework

X: universal set of conceivable alternatives

K: distinguished family of non-empty subsets of X

C: choice function on the choice space (X, K)

$$C(S) \subset S,\ C(S) \neq \emptyset \text{ for all } S \in K$$

N: set of individuals $\{1, 2, \ldots, n\}$

R_i: weak preference ordering of the individual $i \in N$

$P(R_i)$: strict preference of the individual $i \in N$

$$P(R_i) = \{(x, y) \mid (x, y) \in R_i \ \& \ (y, x) \notin R_i\}$$

F: collective choice rule

$$C = F(R_1, R_2, \ldots, R_n)$$

D_i: protected sphere of the individual $i \in N$

$(R_1, R_2, \ldots, R_n)$: profile (of individual preferences)

$(D_1, D_2, \ldots, D_n)$: rights-system

2. Rational Choice Functions

C on (X, K) is <u>rational</u> iff there exists a <u>rationalization</u> $R \subset X \times X$ such that

$$C(S) = \{x^* \in S \mid (x^*, x) \in R \text{ for all } x \in S\}$$

for all $S \in K$. In particular, C on (X, K) is <u>full-rational</u> iff (i) C is rational, and (ii) the rationalization thereof is an ordering on X.

Let:

$$R_C = \{(x, y) \mid x \in C(S) \ \& \ y \in S \text{ for some } S \in K\}$$

$$R_C^* = \{(x, y) \mid x \in C(S) \ \& \ y \in S - C(S) \text{ for some } S \in K\}.$$

A finite set $\{x^1, x^2, \ldots, x^t\}$ is said to be an H-cycle iff $(x^1, x^2) \in R_C^*$, $(x^2, x^3) \in R_C$, $\ldots$, $(x^t, x^1) \in R_C$. C is said to satisfy the <u>Houthakker's axiom of revealed preference</u> (HARP) iff there exists no H-cycle of any order.

C on (X, K) is <u>normal</u> iff $C(S) = C^*(S)$ for all $S \in K$, where

$$C^*(S) = \{x^* \in S \mid (x^*, x) \in R_C \text{ for all } x \in S\}.$$

Theorem 1. C on (X, K) is full-rational iff C satisfies HARP.

Theorem 2. C on (X, K) is rational iff C is normal.

3. Collective Choice Rules: Conditions

(1) Unrestricted Domain: For every profile $(R_1, R_2, \ldots, R_n)$, F generates a well-defined choice function.

(2) Pareto: If $(x, y) \in P(R_i)$ for all $i \in N$, then $[x \in S \to y \notin C(S)]$ for all $S \in K$.

(3) Independence: If $(R_1, R_2, \ldots, R_n)$ and $(R_1', R_2', \ldots, R_n')$ are such that $R_i \cap (S \times S) = R_i' \cap (S \times S)$ for all $i \in N$, then $C(S) = C'(S)$, where $S \in K$ and $C = F(R_1, R_2, \ldots, R_n)$, $C' = F(R_1', R_2', \ldots, R_n')$.

(4) Non-Dictatorship: There exists no dictator for F, where an individual $i \in N$ is said to be the dictator for F iff $(x, y) \in P(R_i)$ implies $[x \in S \to y \in C(S)]$ for all $S \in K$.

(5) Realization of Rights-System: F realizes D iff, for all $(R_1, R_2, \ldots, R_n)$, all $i \in N$ and all $x, y \in X$, $(x, y) \in D_i \cap P(R_i)$ implies $[x \in S \to y \notin C(S)]$ for all $S \in K$.

4. Collective Choice Rules: Two Impossibility Theorems

Theorem 3 (Arrow). There exists no collective choice rule which satisfies all of full-rationality, unrestricted domain, Pareto, independence and non-dictatorship.

Theorem 4 (Sen). There exists no collective choice rule which satisfies all of unrestricted domain, Pareto, and realization of rights-system.

5. Resolutions

- Extended sympathy approach under the identity axiom
- Liberal individual and the respect of others' equal rights
- Justice-constrained claim of rights

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